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#10

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
08/932,427	09/17/97	KITAMURA	Y 1081.1055/JD

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WASHINGTON DC 20001

LM02/0315

EXAMINER

PORTKA, G

ART UNIT	PAPER NUMBER
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2759

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DATE MAILED:

03/15/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.
08/932,427

Applicant(s)
Kitamura

Examiner
Gary J. Portka

Group Art Unit
2759



☒ Responsive to communication(s) filed on Dec 20, 1999

☒ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 35 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claim

☒ Claim(s) 1, 3-7, and 9-16 is/are pending in the application

Of the above, claim(s) _____ is/are withdrawn from consideration

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 1, 3-7, and 9-16 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☒ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) _____

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☐ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

— SEE OFFICE ACTION ON THE FOLLOWING PAGES —

Art Unit: 2759

DETAILED ACTION

1. Claims 1, 4, 7, 10, and 13 have been amended, and claims 14-16 added by Applicant. Claims 1, 3-7 and 9-16 are presented for examination

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 3-7, and 9-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kakuta, U.S. Patent 5,636,356 (hereinafter "Kakuta"), in view of Miskowiec, U.S. Patent 5,915,095 (hereinafter "Miskowiec").

4. As to claims 1, 7, and 13-16 Kakuta discloses a RAID apparatus and control method comprising:

- a. Plurality of disk units (Drives 1-4) storing a plurality of copies of each of logical volumes (individually numbered data blocks #1, #2, etc.), and disk controller (2) for accessing the disk units/logical volumes (see Figures 1 and 4, and column 7 lines 20-39, column 11 lines 1-3);

- b. The disk controller including a memory storing number of request operations to each disk, and control means for accessing one unit in accordance with the number of operations, where the number is incremented for each new request (see column 14 lines 35-49);

Art Unit: 2759

c. Wherein the control means selects the physical disk unit (as a function of comparing the number of operations with a threshold; see column 14 lines 35-49).

Kakuta does not disclose that the number of pending operations for disk units are compared and that the controller selects the one having the least. To better distribute accesses to different drives (which improves overall performance), Kakuta accesses a disk until its count exceeds a threshold, then switches to another disk. However, one of ordinary skill in the art would have recognized that this results in a balancing “tolerance” where the count of each drive may temporarily be higher or lower than the others. An artisan would have recognized that one could more precisely balance the accesses across the drives by comparing the number of accesses pending to each drive for each new access. For example, Miskowiec teaches such a method as one embodiment of balancing accesses to multiple servers containing copies of the same application. See column 2 lines 23-32, column 3 lines 14-20 and 25-28, column 6 lines 51-57, and column 7 lines 3-19 and 35-47. In order to maintain a count of pending requests as taught in Miskowiec, the number is incremented for each new one and decremented for each completed. This teaching is applicable to the system of Kakuta because it likewise involves balancing a plurality of accesses to a plurality of storage systems having multiple copies of data. The comparing of the number of accesses to multiple storage systems, and selection of the one having the least accesses (as taught by Miskowiec) would have provided more precise balancing of the multiple storage unit accesses, thus motivating an artisan to perform this method in Kakuta. Thus it would have been obvious to one of ordinary skill in the art at the time of the invention to compare number of operations to disk units with each other and select the one

Art Unit: 2759

having a minimum, because as taught by Miskowiec comparing of the number of accesses to storage devices to select the one having the least desirably balances multiple accesses to those devices.

5. As to claims 3 and 9, Kakuta discloses channel adapter (6) as claimed (see Figure 1, and column 6 lines 36-47), device adapter (10) for accessing the disk units (see Figure 1 and column 6 lines 4-6), and resource manager circuit (DCU 7) as claimed (see column 7 lines 20-39) .

6. As to claims 4 and 10, Kakuta discloses the incrementing and decrementing number of operations of a disk unit is clearly implemented as described at column 14 lines 35-49.

7. As to claims 5-6 and 11-12, Kakuta discloses the memory stores status information for the disk units, for use in selecting a normal unit (see column 12 lines 39 et seq., where DCU 7 controls fault recovery, and clearly must store information indicating disk unit status to direct access to a normal disk unit).

Response to Arguments

8. Applicant's arguments filed December 20, 1999 have been fully considered but they are not persuasive.

Applicants have argued that Kakuta does not disclose the incrementing and decrementing of the number of operations. Examiner does not agree. In order for Kakuta to be able to store the number of requests for a drive, it must increment the count for each new request. In the prior art combination with the teaching of Miskowiec, which provides for a count of the pending requests to each device and their comparison, both the claimed incrementing and decrementing must occur.

Art Unit: 2759

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for response to this final action is set to expire THREE MONTHS from the date of this action. In the event a first response is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event will the statutory period for response expire later than SIX MONTHS from the date of this final action.

10. **Any response to this final action should be mailed to:**

Box AF
Commissioner of Patents and Trademarks
Washington, D.C. 20231

or faxed to:

(703) 308-9051, (for formal communications, please mark "EXPEDITED PROCEDURE")

or:

(703) 305-9731 (for informal or draft communications, please label "PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA., Sixth Floor (Receptionist).

11. Any inquiry concerning this communication from the Examiner should be directed to Gary J. Portka at telephone number (703) 305-4033. The Examiner can normally be reached on weekdays from 9:00 A.M. to 5:30 P.M.

Serial Number: 08/932,427

Page 6


Art Unit: 2759

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Do Yoo, can be reached on (703) 308-4908. The fax phone number for this Group is (703) 305-9731.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist, whose telephone number is (703) 305-3900.

GJP

Gary J. Portka
Patent Examiner
March 9, 2000


DO HYUN YOO
SUPERVISORY PATENT EXAMINER
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